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EPA Superfund
Record of Decision:

ELLSWORTH AIR FORCE BASE
EPA ID: SD2571924644
OU 05
ELLSWORTH AFB, SD
06/07/1996

Final
Record of Decision for
Remedial Action at Operable Unit 5
Ellsworth Air Force Base, South Dakota

United States Air Force
Air Combat Command
Ellsworth Air Force Base

June 1996

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1.1 SITE NAME AND LOCATION

Operable Unit 5 (OU-5), Landfill No. 4 Area, Ellsworth Air Force Base (EAFB), National Priority List Site.

Meade and Pennington Counties, South Dakota

1.2 STATEMENT OF BASIS AND PURPOSE

This decision document describes EAFB's selected remedial action for Operable Unit 5 (OU-5), in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the contents of the Administrative Record for OU-5, EAFB. The US Environmental Protection Agency (EPA) and the South Dakota Department of Environment and Natural Resources (SDDENR) concur with the selected remedial action.

1.3 ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from OU-5, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

1.4 DESCRIPTION OF SELECTED REMEDY

Twelve potentially contaminated areas, or operable units, have been identified at EAFB. This ROD is for a remedial action at OU-5.

The selected alternative, Covering, includes the following major components:

- Placing a soil cover capable of sustaining perennial vegetation over the landfill area;
- Institutional controls for the landfill area;
- Long-term ground-water monitoring; and, long-term maintenance of soil cover.

1.5 STATUTORY DETERMINATION

The selected remedy is protective of human health and environment, complies with Federal and the State of South Dakota requirements that are legally applicable or relevant and appropriate to the remedial action and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies, to the maximum extent practicable for OU-5. However, because treatment of the principal threats of the OU was not practicable, this remedy does not satisfy the statutory preference for treatment as a principal element. The size of the landfill and the fact that there are no apparent onsite hot spots that represent major sources of contamination precludes a remedy in which contaminants could be excavated and treated effectively.

Because this remedy will result in low levels of hazardous subtances remaining onsite beneath the landfill cover area, a review will be conducted within five years after commencement of remedial action to ensure thata the remedy continues to provide adequate protection of human health and the environment.

1.6 SIGNATURE AND AGENCY CONCURRENCE ON THE REMEDY

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2.0 DECISION SUMMARY

2.1 SITE NAME AND LOCATION

EAFB is a U.S. Air Force Air Combat Command (ACC) installation located 12 miles east of Rapid City, South Dakota, and adjacent to the small community of Box Elder (Figure 2-1).

EAFB covers approximately 4,858 acres within Meade and Pennington counties and includes runways and airfield operations, industrial areas, and housing and recreational facilities (Figure 2-2). Open land, containing a few private residences, lies adjacent to EAFB on the north, south, and west, while residential and commercial areas lie to the east of the base.

2.2 OPERABLE UNIT 5 (OU-5) DESCRIPTION/HISTORY AND REGULATORY OVERSIGHT ACTIVITIES

2.2.1 Description/History

Ellsworth Air Force Base (EAFB) was officially activated in July 1942 as the Rapid City Army Air Base, a training facility for B-17 bomber crews. It became a permanent facility in 1948 with the 28th Strategic Reconnaissance Wing as its host unit. Historically, EAFB has been the headquarters of operations for a variety of aircraft, as well as the Titan I Intercontinental Ballistic Missile, and the Minuteman I and Minuteman II missile systems. The Air Force has provided support, training, maintenance, and/or testing facilities. Presently, the 28th Bombardment Wing (B-1B bombers) is the host unit of EAFB.

Operable Unit 5 (OU-5) is the current designation for the area surrounding and including Landfill No. 4, a 10-acre site located near the northern perimeter of EAFB (Figure 2-3). From the 1940s through 1990, Landfill No. 4 was used primarily for the disposal of construction demolition and hardfill materials; however, reports and visual observations from previous installation restoration program (IRP) studies noted that this site was also used for general refuse and drum disposal. Numerous empty unlabeled drums as well as empty historic investigation derived waste (IDW) drums were observed at the landfill during the 1993/95 remedial investigation (RI). The base commander terminated waste disposal activities at this landfill after 1990.

Topographically, the northern portion of Landfill No.4 dips steeply to the north-northwest. The eastern portion of the OU dips less steeply to the south and southwest. Several incised valleys exist to the north and east of Landfill No. 4. These valleys carry storm-water runoff off-Base, north and northeast of OU-5 into several unnamed ephemeral tributaries of Elk Creek, which is north of the Base boundary. The southern portion of the landfill slopes slightly to the south, while southwest of the landfill the topography is fairly level with a slight rise associated with a Base perimeter service road. While part of the landfill has an existing soil cover that is vegetated, portions of the former disposal area contain exposed landfill materials.

The uppermost geologic deposits at OU-5 are predominantly silt and clay, underlain in places by coarse sand and gravel. These deposits are typically thicker on terraces and drainage slopes (25 to 35 feet) and thinner in drainage bottoms (2 to 5 feet). Where present, gravels are usually deposited directly on the Pierre Shale and range in thickness from less than 2 feet to more than 20 feet. Depth to shallow ground water at OU-5 ranges from approximately 12 to 36 ft.

The shallow aquifer at EAFB is considered a potential drinking water source and possibly discharges to the surface. The ground water is classified as having a beneficial use as a drinking water supply suitable for human consumption (ARSD Chapter 74:03:15, Groundwater Quality Standards).

Deeper bedrock aquifers also exist beneath EAFB. These deeper aquifers are separated from the shallow aquifer by 800 feet of impermeable clays and silts. In the past, EAFB utilized these deeper aquifers for its water supply. Presently, EAFB obtains its potable water from the Rapid City Municipal Distribution System.

2.2.2 Regulatory Oversight Activities

Environmental investigation activities at EAFB were initiated by the Air Force in 1985 through an IRP Phase I Installation Assessment/Records Search and Phase II, Confirmation/Quantification. The Phase I study, dated September 1985, identified a total of 17 locations at EAFB where releases involving hazardous substances potentially occurred.

In Phase II of the IRP investigation, field activities included soil vapor surveys, geophysical surveys, surface and subsurface soil sampling, ground-water sampling, ground-water hydrologic testing, and ecological investigations.

On August 30, 1990 (55 Federal Register 35509), EAFB was listed on the U.S. EPA's National Priority List (NPL). A Federal Facility Agreement (FFA) was signed in January 1992 by the Air Force, EPA, and the State of South Dakota (State) and went into effect April 1, 1992. The FFA establishes a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions for EAFB in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). It also states the oversight procedures for EPA and the State to ensure Air Force compliance with the specific requirements. The FFA identified 11 site-specific operable units (OUs) and a Basewide ground-water OU. The Basewide ground-water OU is primarily used to address contaminated ground water that was not addressed during an investigation of a site-specific operable unit.

Listing on the NPL and execution of the FFA required the Air Force to perform a remedial investigation/ feasibility study (RI/FS) to investigate the 12 OUs. In 1993 and 1994, an extensive RI field program was conducted to characterize conditions at OU-5. The program included drilling and sampling of boreholes, installation of monitoring wells, ground-water sampling, geotechnical analysis of soil samples, ecological evaluation, assessment of human health risks, and review and compilation of previous IRP investigations. Collection and laboratory analysis of soil, ground water, surface water, and sediment samples were included in the RI field program.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Community relation activities that have taken place at EAFB to date include:

- FFA process. After preparation of the FFA by the USAF, EPA, and SDDENR, the document was published for comment. The FFA became effective April 1,1992.

- Administrative Record. An Administrative Record for information was established in Building 8203 at EAFB. The Administrative Record contains information used to support USAF decision-making. All the documents in the Administrative Record are available to the public.

- Information repositories. An Administrative Record outline is located at the Rapid City Library (public repository).

- Community Relations Plan (CRP). The CRP was prepared and has been accepted by EPA and the State of South Dakota and is currently being carried out. An update to this plan will be prepared in 1996.

- Restoration Advisory Board (RAB). The RAB has been formed to facilitate public input in the cleanup and meets quarterly. In addition to USAF, EPA, and South Dakota oversight personnel, the RAB includes community leaders and local representatives from the surrounding area.

- Mailing list. A mailing list of all interested parties in the community is maintained by EAFB and updated regularly.

- Fact sheet. A fact sheet describing the status of the IRP at EAFB was distributed to the mailing list addressees in 1992.

- Open house. An informational meeting on the status of the IRP and other environmental efforts at EAFB was held on May 6, 1993. An open house was held November 16, 1995 in conjunction with the Restoration Advisory Board meeting. Information on the status of environmental efforts at EAFB was provided at the open house.

- Newspaper articles. Articles have been written for the Base newspaper regarding IRP activity.

- Proposed Plan. The proposed plan on this action was distributed to the mailing list addressees for their comments.

A public comment period was held from December 28, 1995 to January 26, 1996, and a public meeting was held on January 11, 1996. At this meeting, representatives from EAFB answered questions about the remedial action. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision (ROD).

This ROD is based on the contents of the Administrative Record of OU-5, in accordance with CERCLA, as amended by SARA, and the NCP. The RI/FS reports and the Proposed Plan for OU-5 provide information about OU-5 and the selected remedy. These documents are available at the Information Repositories at EAFB and Rapid City Public Library.

2.4 SCOPE AND ROLE OF RESPONSE ACTION

The FFA identified 11 potential source are operable units (OUs) as well as a Base-wide ground-water operable unit. The 12 operable units are identified as follows:

OU-1	Fire Protection Training Area
OU-2	Landfill Nos. 1 and 6
OU-3	Landfill No. 2
OU-4	Landfill No. 3
OU-5	Landfill No. 4
OU-6	Landfill No. 5
OU-7	Weapons Storage Area
OU-8	Explosive Ordnance Disposal Area (Pramitol Spill)
OU-9	Old Auto Hobby Shop Area
OU-10	North Hanger Complex
OU-11	Base-wide Ground Water
OU-12	Hardfill No. 1

This ROD is to document the selected remedy for the preferred remedial action (RA) at OU-5. The remedial action objectives (RAOs) are to reduce the potential risks posed by contaminants in surface soils and to reduce the mobility of potential contaminants in the landfill through containment.

The development of alternatives for the landfill was conducted under the EPA's Presumptive Remedies Approach [Presumptive Remedies: Policy and Procedures (OSWER Directive 93550.0-47FS): Presumptive Remedy for CERCLA Municipal Landfill Sites (OSWER Directive 93550.0-49FS)]. By using this approach, selecting an alternative for remediation is streamlined by using preferred technologies based on historical patterns of remedy selection and the EPA's scientific and engineering evaluation of performance data on technology implementation.

The presumptive remedy stipulates containment as the appropriate remedy for landfills. The response action containment by covering, would remove risk associated with the ingestion, dermal contact and inhalation exposure pathways. The area over which remediation goals will be achieved after remediation is complete is defined as the area of attainment and is based on the RAOs. For OU-5, the area of attainment consists of the identified boundaries of Landfill No. 4. This include the areas of the landfill not meeting appropriate State of South Dakota closure standards. Measures to address leachate or gas collection were not considered since identified wastes placed in the landfill are not likely to produce significant amounts of gas, nor does the waste typify that which would normally be associated with leachate production.

2.5 SITE CHARACTERISTICS

This section describes the presence and distribution of contaminants at OU-5 as a result of past activities.

2.5.1 Soils

Soil Vapor

A total of 150 soil vapor samples were collected within the landfill boundary and analyzed during the field investigation at OU-5. From these samples, three volatile organic compounds (VOCs), 1,1,1,-tetrachloroethane (TCA), methylene chloride, and cis-1,2-dicholoroethene, were each detected once, trichloroethylene (TCE) was detected twice, and perchloroethylene (PCE) was detected in six samples.

Volatile Organic Compounds (VOCs)

Eight soil samples were analyzed for VOCs during the RI. These samples were collected out of the fill and downgradient from the landfill. There were no VOVs reported from surface or capillary fringe (subsurface) samples collected at OU-5.

Semivolatile Organic Compounds (SVOCs)

Nine separate SVOCs were reported from the eight soil samples from OU-5. Surface soil samples had reported concentrations of eight different polycyclic aromatic hydrocarbons (PAHs) at estimated values (48 micrograms per kilogram [µg/kg] to 250 µg/kg), which are below the sample quantitation limit. No PAHs were reported in capillary fringe soil samples. The source of the reported PAHs is considered a result of disposal of fill over the north edge of the landfill area.

Total Petroleum Hydrocarbons (TPH) as Jet Fuel

Eight soil samples were analyzed for TPH as jet fuel (JP-4). Jet fuel was reported in one surface soil sample at a concentration of 190 milligrams per kilogram (mg/kg).

Pesticides

Two pesticides (endrin and heptachlor epoxide) were reported from the eight samples analyzed. The pesticides were detected from a single surface soil sample at levels below quantitation limits. No pesticides were reported in the capillary fringe soil samples.

Inorganic Contaminants

Four samples from OU-5 were sampled for inorganics. Manganese, potassium, and silver were reported at values greater than the background range. The risk assessment indicated that no unacceptable risk exists for these inorganic compounds.

2.5.2 Ground Water

Volatile Organic Compounds (VOCs)

Six monitoring wells were sampled for VOCs at OU-5. Four VOCs were detected in the ground-water samples. Three of the four detected VOCs were from sample from a single well from which samples were deemed to be non-reportable according to the Final Sampling and Analysis Plan, Volume II: Quality Assurance Project Plan (QAPP). The fourth VOC was reported at an estimated value below the sample quantitation limit. There were no exceedances of federal MCLs or state ground water quality standards.

Semivolatile Organic Compounds (SVOCs)

The most frequently detected SVOC, bis(2-ethylhexyl) phthalate, was detected twice at a maximum concentration of 6.0 micrograms per liter (µg/L), however, bis(2-ethylhexyl) phthalate was also reported in the associated laboratory bland at a concentration above EPA usability criteria values identified in the QAPP and is therefore not considered reportable.

TPH (Jet Fuel)

Jet fuel was reported in one sample at a concentration of 100 µg/L.

Pesticides/Polychlorinated Biphenyls (PCBs)

No pesticides or PCBs were reported from the five locations sampled at OU-5.

Inorganic Contaminants

Four wells were sampled for inorganic contaminants at OU-5. Thirteen inorganic were reported at concentrations exceeding the background range. The risk assessment indicated that no unacceptable risk exists for these inorganic compounds.

2.5.3 Surface Water/Sediment

One surface water sample was analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. One VOC and one tentatively identified SVOCs were reported from this sample. No pesticides or PCBs were reported. Eleven inorganics were reported.

One sediment sample was also analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. One VOC and two SVOCs were reported from this sample. No pesticides or PCBs were reported. Twenty inorganics were reported.

As there was only a single sample collected for surface water and sediment, a site mean and upper confidence limit could not be calculated. The source of the reported inorganics is considered a result of both landfill activity and naturally-occurring geologic deposits.

2.6 SITE RISK SUMMARY

2.6.1 Human Health Risks

Risk Assessment Process

The assessment of human health risks for this OU considered the following topics:

(1) Contaminants of concern (COCs) in ground-water, surface water, sediment, and soil samples taken at OU-5;

(2) Current and future land-use conditions;

(3) Potential environmental pathways by which populations might be exposed;

(4) Estimated exposure point concentrations of COCs;

(5) Estimated intake levels of the COCs;

(6) Toxicity of the COCs; and

(7) Uncertainties in the assessments of exposure, toxicity, and general risks.

Noncarcinogenic and carcinogenic risks were calculated for the following four potential exposure groups:

(1) Current adult trespasser who ingests surface soil;

(2) The future child/adult living onsite who ingest surface soil;

(3) The future adult living onsite who ingests and showers with shallow ground water;

(4) Future adult construction workers who excavate onsite for building residences.

A quantitative risk assessment was performed for the ground water, surface water, soil, sediment, and air. The risk assessment evaluated potential effects on human health posed by exposure to contaminants within OU-5. Carcinogenic risks were estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a potential cancer causing chemical. The acceptable risk range expressed as a probability is one cancer incident in ten thousand people to one cancer incident in a million people. This level of risk is also denoted by 1 x 10-4 to 1 x 10-6. Risks within the acceptable risk range may or may not warrant remedial action depending upon site-specific circumstances. Risks below this range cannot be differentiated from the background occurrence of cancer in human populations. Risks calculated in a risk assessment are potential risks and are excess (i.e., over background) cancer risks due to exposure form contaminants at the OU.

Noncarcinogenic health risks are evaluated using a hazard index. If the hazard index is less than or equal to one, the contaminant concentration is considered an acceptable level and generally assumes that the human population may be exposed to it during a 30-year period without adverse health effects.

Risk Assessment Results

The risk assessment for OU-5 indicated that the carcinogenic risk was within the acceptable risk range of 1 x 10-4 to 1 x 10-6. Part of the site risk present at OU-5 includes risk from exposure to surface soil contaminants from within the landfill. Due to the heterogeneity of the landfill contents, uncertainty is associated with the calculated risk values for the surface soil.

The risk assessment for OU-5 indicated that there were no noncarcinogenic risks resulting in an HI above 1.0.

Results of the risk assessment indicated shallow ground water and surface water were not media of current concern. Therefore, remedial action is not warranted for the ground water and surface water at this time. The ground water at OU-5 will still be retained as part of the Base-wide ground water evaluation for OU-11.

Risk Summary

Remedial action is warranted for the landfill based on the potential risk to human health from future releases of unidentified hazardous substances in the landfill. Contaminants in the landfill may leach downward to contaminate the underlying ground water. Off-base, residents may then ingest or come in contact

with the contaminated ground water. Also, the surface of the landfills may erode, thus exposing off-Base residents to contaminants in both surface water and air. Due to the potential heterogeneity of the waste materials present within the landfill uncertainty is associated with the calculated risk values for surface soil.

Rather than attempting to gain more certainty in the risk assessment for the landfill contents, the Air Force utilized guidance developed by EPA titled Presumptive Remedy for CERCLA Municipal Landfill Sites (OSWER Directive 9355.0-49FS). The presumptive remedy for landfills is onsite containment of landfill contents. Using the presumptive remedy strategy, a quantitative risk assessment is not necessary to evaluate whether the containment remedy addresses all exposure pathways and contaminants potentially associated with a landfill. Rather, all potential exposure pathways can be identified using the conceptual site model and compared with the pathways addressed by the presumptive remedy. Containment of the landfill contents addresses exposure pathways and risks normally associated with landfills. The contaminant exposure pathways for the potential risks at OU-5 include (1) direct physical contact with the landfill contents and (2) consumption or contact with ground water that is or may become contaminated.

Actual or threatened releases of hazardous substances from OU-5, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, and the environment.

2.6.2 Ecological Risks

An ecological risk evaluation of OU-5 was based on a combination of data and literature reviews, field and laboratory analysis, analyte evaluation and screening, and preliminary risk screening. The pertinent findings are summarized below.

A variety of animal species may live, forage, or nest in OU-5 habitats. These species include various types of invertebrates, amphibians, birds, and mammals. Terrestrial vegetation and soil faunal communities do not reveal characteristics that indicate chemical-related impacts. This finding is consistent with the relatively low levels of contaminants in the soil.

Because of the altered natural environment at OU-5, rare threatened, or endangered species, are unlikely to utilize the area for more than a brief, periodic habitat. Due to the low levels of contaminant concentrations, the contaminants do not pose an unacceptable risk to these species. In addition, the limited contact these species would have with the OU-5 area ensures unacceptable risk to a single individual will not occur. Chapter 6 of the OU-5 RI gives a detailed evaluation of the ecological risk assessment and lists the potential ecological receptors.

Findings of the RI indicated that the contaminants at OU-5 are not altering the ecology to noticeable levels. A Base-wide ecological risk assessment will be conducted as part of OU-11, and OU-5 will be included in this Base-wide evaluation.

2.7 DESCRIPTION OF ALTERNATIVES

Presumptive Remedy for CERCLA Municipal Landfill Sites, (OSWER Directive 9355.3-11FS) was the basis for the abbreviated feasibility study (FS). The OSWER directive established containment of the contamination within the landfill and the collection and treatment of landfill gas and contaminated ground water within the landfill boundary as the presumptive remedy for CERCLA municipal landfills.

Although not specifically identified as a municipal landfill, OU-5 exhibits characteristics that make this presumptive remedy applicable. The landfill contents at OU-5 do no have the characteristics to produce any significant leachate or gases. The risk assessment did not identify the ground water at OU-5 as a pathway of concern. Though the landfill contents were not identified as a source of unacceptable risk to human health, the heterogeneity of the landfill contents causes uncertainties in the risk assessment. Therefore, the presumptive remedy focuses on containment of the landfill contents.

Alternative 1 - No Action

- No Action
- The no action alternative represent the baseline condition at OU-5 and refers to taking no further action at OU-5. It is expected that any existing maintenance (e.g., grass mowing) would be continued.

The no action alternative does not meet remedial action objectives for OU-5.

Alternative 2 - Institutional Controls

- Implementing access restrictions.
- Restricting future land and ground-water use.
- Developing long-term ground-water monitoring.
- Developing a long-term maintenance plan for the existing soil cover.

This alternative does not meet the remedial action objectives for OU-5.

Alternative 3 - Vegetative Soil Cover

- Placing a soil cover capable of sustaining perennial vegetation over the landfill area;

- Institutional controls for the landfill area;

- Long-term ground-water monitoring; and, long-term maintenance of soil cover.

2.8 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The analysis of alternatives coupled with the use of the presumptive remedy combine for a narrower range of feasible approaches to address remedial activities at OU-5.

The remedial action objectives for OU-5 are as follows:

Landfill

- Provide protection against direct contact or ingestion of the landfill contents.
- Minimize infiltration through the landfill.
- Control surface water runoff and erosion of the landfill cover.

The area of attainment is defined as the area that will achieve the remedial action objectives after remediation is completed. The area of attainment for OU-5 is the extent of Landfill No. 4 that is approximately 10 acres in size.

Pursuant to Section 300.430(e)(9)(iii) of the EPA's revised National Contingency Plan, the remedial action to be implemented should be selected based upon consideration of nine evaluation criteria. These criteria are as follows:

1. Overall protection of human health and environment.
2. Compliance with applicable or relevant and appropriate requirements (ARARs).
3. Long-term effectiveness and permanence.
4. Reduction of toxicity, mobility, or volume of contamination.
5. Short-term effectiveness.
6. Implementability.
7. Cost.
8. State acceptance.
9. Community acceptance.

The following sections provide a brief review and comparison of the remedial alternatives according the EPA's evaluation criteria.

2.8.1 Overall Protection of Human Health and the Environment

The assessment of this criterion considers how the alternatives achieve and maintain protection of human health and the environment.

Alternative 1 (no action) does nothing to reduce risk at OU-5. Alternative 2 (Institutional Controls) provides for care of the OU through maintenance of erosional and/or non-vegetated areas. Access restrictions would reduce risk by reducing exposure. Alternative 3 (Covering) provides containment of the surface soil and the landfill contents. This would eliminate risk associated with exposure to soil and the future risk associated with potentially contaminated ground water.

2.8.2 Compliance with ARARs

Alternatives are assessed under this criterion in terms of compliance with ARARs. Applicable requirements include cleanup standards, of control and other substantive environmental protection requirements criteria or

limitations promulgated under Federal or state laws. These laws specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstances at a CERCLA site.

ARARs are grouped into these three categories:

- Chemical-Specific ARARs are health or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in establishment of the amount or concentration that may be found in, or discharged to, the environment.
- Location-Specific ARARs restrict the concentration of hazardous substances or the conduct of activities solely because they are in specific locations such as flood plains, wetlands, historic places, and sensitive ecosystems or habitats.
- Action-Specific ARARs are usually technology or activity-based requirements or limitations on actions taken with respect to hazardous wastes.

State of South Dakota guidelines for petroleum in soils are the only known chemical-specific ARARs for soil at OU-5. Detected levels of petroleum-related compounds do no exceed State ARARs at OU-5. Ground water at OU-5 is not contaminated above State or Federal MCLs. Inorganics detected in the one surface water sample collected that were above Federal Ambient Water Quality Criteria were determined to be naturally occurring and are not considered for remediation. There are no State or Federally promulgated standards for chemicals in sediments.

A summary evaluation of Federal and State ARARs pertinent to this remedial action is provided in Table 2-1 at the end of Section 2.0, and a narrative discussion of compliance with ARARs is provided below for the alternatives considered.

Alternative 1 (No Action):

The No Action alternative does not comply with State solid waste landfill closure requirements. The OU-5 RI concluded that ground water has not been adversely affected and has not been a potential transport pathway; therefore, ground water ARARs at the OU are met. No permits are required for this alternative. However, Alternative 1 does not meet the remedial action objectives for OU-5 because an action would not be taken to prevent human contact with surface-soil contaminants, and because potential contaminants within the landfill may leach to the ground water.

Alternative 2 (Institutional Controls):

Alternative 2 does not comply with State of South Dakota solid waste landfill closure requirements. The OU-5 RI concluded that ground water has not been adversely affected and has not been a potential transport pathway; ground-water ARARs at the OU are met. No Federal or State permits are required for this alternative. However, Alternative 2 does not meet the remedial action objectives for OU-5 because an action would not be taken to prevent human contact with surface-soil contaminants and because potential contaminants within the landfill may leach to the ground water.

Alternative 3 (Covering):

Alternative 3 would meet State of South Dakota Waste Management Regulations for the disposal of solid waste be providing a two-foot minimum earth cover capable of sustaining perennial vegetation, implementing institutional controls including maintaining access control, filling, grading, and contouring the site, maintenance of the cover and vegetation, and other requirements as set forth in ARSD Chapter 74:27:15. The State is Federally authorized for the Resource Conservation and Recovery Act (RCRA) Subtitle D Municipal Solid Waste Program (8 October 1993, 58 FR 52486).

Long-term ground-water monitoring will be used to verify continued compliance with Federal MCLs (National Primary Drinking Water Regulations, 40 CFR 141.11-12) and State Ground Water Quality Standards beyond the boundary of the landfill. By following the presumptive remedy approach, the MCLs are not considered ARARs for the ground water within the boundaries of the landfill.

Implementation of the presumptive remedy strategy for landfills has been shown by EPA to meet the remedial action objectives by preventing direct contact with landfill contents and ingestion of surface soils.

2.8.3 Long-Term Effectiveness and Permanence

The assessment of this criterion included long-term effectiveness of alternatives in maintaining protection of human health and the environment after response action objectives have been met.

Alternative 1 would not provide additional effectiveness or permanence in reducing the potential for direct contact or ingestion of the surface soil or sediments. No further controls for the OU would be developed under this alternative.

Alternative 2 would be effective in reducing direct exposure to landfill contents by restricting access to the site (in addition to the general EAFB access restrictions). This alternative would not reduce the potential impacts to ground water from percolation of rainwater through those areas of the landfill not adequately covered. Long-term maintenance of the existing cover and vegetation at Landfill No.4 would somewhat reduce the potential for erosion of the existing cover. Permanency and reliability of these controls would be evaluated through long-term ground-water monitoring and maintenance of the existing landfill soil cover. Uncertainties exist for the ability to provide long-term access restrictions.

Alternative 3 would offer the highest level of long-term effectiveness in reducing risk due to exposure of contaminants in the landfill, and would significantly reduce the potential for landfill contents to impact ground-water quality. Access restrictions would deter unauthorized access to the site. Installing an earth cover would effectively contain the contents of the landfill and reduce the potential for exposure to contaminants. Providing positive drainage off the site would also reduce ponding on the landfill and further reduce the potential for infiltration. Erosion would be limited by the development and maintenance of vegetation. Permanency and reliability would be evaluated through long-term ground-water monitoring and maintenance of the existing landfill cover and vegetation. Future land uses will be allowed for the landfill only if the integrity of the landfill cover is not compromised.

2.8.4 Reduction Toxicity, Mobility, and Volume Through Treatment

The assessment of this criterion involves considering the anticipated performance of specific treatment technologies an alternative may employ.

Alternative 1 would not provide for the reduction to toxicity, mobility, and volume of the chemicals or concern in the surface soil and sediment. Alternative 2 would reduce the mobility of contaminants in surface soils through long-term erosion maintenance of existing cover soils. Alternative 3 reduces infiltration and potential wind-blown contamination through containment; however, treatment of the contamination is not being proposed.

2.8.5 Short-Term Effectiveness

The assessment of this criterion considers the effectiveness of alternatives in maintaining protection of human health and the environment during the construction of a remedy until response action objectives have been met.

It is not anticipated that the proposed alternatives would significantly impact worker or community health and safety during the implemention period. Alternatives 2 and 3 may impact community and worker health and safety through cost emissions during the intitial construction phase. The impact could be minimized through dust mitigation.

Alternative 2 and 3 may create a short-term increase in risk during remedial activities due to the inhalation exposure pathway. Disturbance of surface soil through earthwork and soil disturbance would result in exposure to workers. Dust mitigation during these activities would minimize this potential impact. Alternative 3 would present the potential for temporarily increasing the opportunity for erosion of the disturbed soils, although erosion and sediment control measures will help to minimize this adverse impact.

2.8.6 Implementability

The assessment of this criterion considers the administrative and technical feasibility of implementing the alternatives and the availability of necessary goods and services for implementation of the response action.

Alternative 1 would not bee difficult to implement since, besides long-term monitoring using existing monitoring wells, no further action would be undertaken.

Alternative 2 requires no special or unique activities and could be implemented using locally available materials and contractors. Long-term monitoring would indicate whether additional action would need to be implemented in the future.

Alternative 3 could be implemented with standard construction equipment, materials, and methods. The availability of an on- or off-Base supply of cover material will require further consideration during the Remedial Design Analysis. Land use (or deed) restrictions can be implemented at EAFB by various administrative means.

2.8.7 Cost

The assessment of this criterion considers the capital and operation and maintenance (O&M) costs associated with each alternative. Alternatives are evaluated for cost in terms of both capital costs and long-term O&M costs necessary to ensure continued effectiveness of the alternatives. Capital costs include the sum of the direct capital costs (material and labor) and indirect capital costs (engineering, licenses, permits). Long-term O&M costs include labor, materials, energy, equipment replacement, disposal, and sampling necessary to ensure the future effectiveness of the alternative. The objective of the cost analysis is to eliminate those alternatives that do not provide measurably greater protection of human health and the environment for additional costs that may be incurred. Cost estimates do not include yearly escalation adjustments. Final costs developed in the Remedial Design will be structured using the Remedial Action Work Breakdown structure. A summary of the costs for each alternative is as follows:

Alternative No. 1 (No Action)

Total Capital Costs	$0
Total Annual (Sampling/Analysis) Costs	$0
30-Year Present Value for Annual Costs Annual Cost = $13,500 Years = 30 Discount Rate = 5%	$0
Total 30-Year Present Value1	$0

Alternative No. 2 (Institutional Controls)

Total Capital Costs	$45,198
Total Annual (Sampling/Analysis/O&M2) Costs-Years 1-5	$70,552
Total Annual (Sampling/Analysis/O&M) Costs-Years 6-30	$36,752
30-Year Present Value for Annual Costs Years = 30 Discount Rate = 5%	$711.044
Total 30-Year Present Value1	$756,242

Alternative No. 3 (Capping)

Total Capital Costs	$1,063,133
Total Annual (Sampling/Analysis/O&M) Costs-Years 1-5	$70,552
Total Annual (Sampling/Analysis/O&M) Costs-Years 6-30	$36,752
30-Year Present Value for Annual Costs Years = 30 Discount Rate = 5%	$711,044
Total 30-Year Present Value1	$1,774,177

Notes

1) The Total 30 Year Present Value is the sum of the total capital costs and the 30-Year present Value for annual costs.
2) Operable & Maintenance.

2.8.8 State Acceptance

The assessment of this criterion considered the State's preferences for or concerns about the alternatives.

The State concurs with the selected remedy. The State provided comments on the remedial investigation, feasibility study, Proposed Plan, and this ROD. After incorporating adequate responses to the comments into the respective documents, the State concurred with the remedy.

2.8.9 Community Acceptance

Comments offered by the public were used to assess the community acceptance of the proposed alternative. The community expressed their concerns about the selected remedy during the public comment period. The questions and concerns of the community are discussed in detail in the Responsiveness Summary that is Appendix B of the ROD.

2.9 SELECTED ALTERNATIVE

Based on the requirements of CERCLA, comparative analysis of the nine criteria, public comments, and in consultation with EPA and the State, the Air Force has determined that the selected alternative is Alternative 3, Vegetative Soil Covering. This alternative includes institutional controls in conjunction with physical modification of the OU to reduce potential risk. Five-year reviews of the remedy will be required because potential contaminants will remain at OU-5 following completion of remedial action.

Major components of Alternative 3 are:

- Placing a soil cover capable of sustaining perennial vegetation over the landfill area;
- Institutional controls for the landfill area;
- Long-term ground-water monitoring; and, long-term maintenance of soil cover.

Each item is discussed below.

Installation of Soil Cover

A pre-design study will be conducted to verify the defined limits of the landfill and determine the type and extent of cover needed. It is anticipated that a single-layer earth cover, two feet thick will be placed over the area of attainment (approximately 10 acres). The cover will meet State landfill closure requirements. The cover material must be capable of sustaining vegetation. Borings drilled during the pre-design study would be used to determine the quantity of material required to construct a cover of the required thickness. The pre-design study would also be used to determine the type of cover needed to reduce infiltration of precipitation through the landfill and ensure continued compliance with the Federal MCLs and State Ground Water Quality
Standards.

The area of attainment will be filled, graded, and contoured to maintain stability, eliminate slumping, settling, or ponding of water above previously active disposal areas, and to provide positive drainage off the landfill area. Vegetation will be established in areas of OU-5 that are under-vegetation and areas disturbed by new construction and cover placement to enhance evapotranspiration and reduce infiltration and soil erosion.

Institutional Controls

Institutional controls will be implemented to prevent human exposure to contaminated soil and ground water. These controls will include: (1) issuing a continuing order to restrict onsite worker access to contaminated soil, and restrict or control temporary construction activities unless proper protective equipment is worm; (2) filing a notice with the State of South Dakota to recommend denial of water appropriations permit applications to install ground-water wells within the landfill boundary and the area of potential contamination; (3) annotating base records in the event of property transfer.

A continuing order would be issued by the Installation Commander to restrict access to or disturbance of the landfills as long as Ellsworth AFB owns the property. Specifically, it would:

- Restrict or place limitations on the installation of any new underground utilities or other construction activities in the area of the landfills, thus preventing accidental exposures to construction workers.

- Provide for the use of proper protective equipment, in the event that access through the landfill cover is required.

- Require that the integrity of the landfill covers are maintained. Limit future land uses to non-intrusive activities only (or activities that will not effect the landfill cover). Maintenance of the landfills will require development of standard operating procedures (SOPs) to provide for inspections and repairs. To assist with the institutional controls, a fence will be place around the landfill and authorized personnel would have access through a locked gate. Access would only be allowed to perform landfill maintenance and monitoring activities. Warning signs will be posted at the landfill to deter unauthorized access.

The continuing order also will mandate that, if the landfill covers were ever removed or destroyed, the area of attainment will be reevaluated to determine the need for a replacement cover or other remedial action.

Continuing order requirements will be in effect as long as the property is owned by Ellsworth AFB. In the case of the sale or transfer of property within OU-5 by the United States to any other person or entity, the Air Force will place covenants in the deed that will restrict access and prohibit disturbance of the landfill or the remedial action without approval of the United States. These covenants will be in effect until removed upon agreement of the State of South Dakota, the U.S. Environmental Protection Agency, and the U.S. Air Force or their successors in interest. The Air Force will also include in the deed the covenants required by section 120(h)(3) of CERCLA, which include (1) a warranty that the United States will conduct any remedial action to be required by law after the date of the transfer; (2) a right of access in behalf of EPA and the Air Force or their successors in interest to the property to participate in any response or corrective action that might be require after the date of transfer. The right of access referenced in the preceding sentence shall include the State of South Dakota for purposes of conducting or participating in any response or corrective action that mighty be required after the date of transfer.

Long-Term Monitoring and Maintenance

A long-term monitoring program will be developed and implemented during remedial action and is subject to approval of both EPA and SDDENR. Contaminant concentrations in the ground water will be monitored to evaluate the effectiveness of the existing landfill cover and to determine if the ground-water is being further impacted by the contents of the landfill.

A maintenance program will be implemented to ensure the long-term integrity on the existing landfill conditions that will be maintained. The maintenance program will include development of SOPs to provide for inspections, repairs, and general maintenance of the landfills.

This alternative will meet the remedial action objectives and reduce the potential risk for OU-5 by preventing future exposure to contaminants in the surface soils and by reducing the mobility ofl potential contaminants in the landfill.

For Landfill No. 4, Alternative 3 will achieve significant risk reduction by limiting exposure to landfill materials and to contaminants present in surface soils and would reduce the potential for future movement of contaminants in the ground water beneath the landfill. The selected alternative will be protective of human health and the environment and will comply with ARARs.

2.10 STATUTORY DETERMINATIONS

This selected remedy meets the statutory requirements of Section 121 of CERCLA as amended by SARA. These requirements include protectiveness of human health and the environement, compliance with ARARs, cost effectiveness, and utilization of permanent solutions and alternative treatment technologies to the extent practicable. The statutory preference for treatment is not satisfied; however, the selected alternative is the presumptive remedy for landfills. Containment, by definition, does not attempt to reduce the toxicity or volume of potentially hazardous materials; rather, it reduces the likelihood of exposure to these materials by preventing the movement of materials beyond the boundaries of the landfill and preventing direct contact with landfill materials. The selected remedy represents the best balance for tradeoffs among the alternatives considered, with respect to pertinent criteria, given the scope of the action.

The manner which the selected remedy meets each of these requirements is discussed in the sections below.

2.10.1 Protection of Human Health and the Environment

Implementation of the presumptive remedy (containment by covering) strategy for landfills has been shown by EPA to meet the remedial action objectives and to protect human health and the environment by preventing (1) direct contact with landfill contents and (2) ingestion of surface soils. Specifically, the covering

alternative:

- Eliminates exposure to landfill contents by installing an earth cover.
- Reduces the potential infiltration of rainwater and leaching of contaminants to the ground water.
- Prevents unauthorized access to the area by installing a perimeter fence and restricted access signs.
- Provides for long-term monitoring of ground water to identify potential future risks associated with OU-5.

2.10.2 Compliance with ARARs

Alternative 3 will meet State landfill closure requirements by providing the required amount of cover over the landfill, site improvements, access/land and ground-water use restrictions, and long-term monitoring. The OU-5 RI concluded that ground water has not been adversely affected and has not been a potential transport pathway; therefore, ground water ARARs at OU-5 are met. Additional information about ARAR compliance is contained in Section 2.8.2.

2.10.3 Cost Effectiveness

The selected remedy provides overall effectiveness in reducing human health risks relative to its costs. The presumptive remedy process ensures cost-effective remedies are chosen. The chosen landfill cover type ensures containment of the landfill contents. Site specific conditions were used to determine the type and extent of cover necessary for the landfill. Based on the information provided during the remedial investigation and the predesign study, the most effective cover will be installed.

2.10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Extent Possible

EPA has established that installing a proper cover has proven effective in containing landfill contents. This alternative provides long-term prevention of exposure to potential landfill materials, prevents unauthorized access, and provides for long-term ground water monitoring to detect movement of chemicals form the area. A five-year review of the selected remedy will be performed due to the uncertainty of characterizing landfill contents. The review will be conducted no less than every five years after signing of the ROD to ensure the remedy continues to provide adequate protection of human health and the environment. Results of the review will be used to determine if modification of any or all parts of the selected remedy will be required.

2.10.5 Preference for Treatment as a Principal Element

Treatment of the landfill contents is not supported based on the finding of the remedial investigation for OU-5. No identifiable hot spots were detected that would warrant removal and/or separate treatment. The risks associated with OU-5 can be addressed by eliminating exposure to the landfill contents by installing a cover and restricting access.

2.11 DOCUMENTATION OF SIGNIFICANT CHANGES

The selected action is the same as the preferred alternative presented in the Proposed Plan for OU-5 remedial action. There have been no significant changes relative to the Proposed Plan.

TABLE 2-1 EVALUATION OF FEDERAL AND STATE ARARS THAT APPLY TO OU-5, ELLSWORTH AFB, SOUTH DAKOTA

Applicable or Relevant and Appropriate Federal Standards, Requirements, Criteria and Limitations

Standards, Requirement, Criteria or Limitation	Citations	Description	ARAR Type	Applicability
Safe Drinking Water Act	42 USC 300 f.g			
National Primary Drinking Water Standards	40 CFR Part 141.11-12	Establishes health-based standards for public water system (maximum contaminant levels)	Chemical	Relevant and appropriate for federal Class II aquifers.
National Secondary Drinking Water Standards	40 CFR Part 143.03	Establishes aesthetic-based standards for public water systems (maximum contaminant levels)	Chemical	Relevant and appropriate.
Maximum Contaminant Level Goals	40 CFR Part 141.50 & Public Law No. 99-330, 100 Stat. 642 (1996)	Establishes drinking water quality goals set at concentrations of unknown or anticipated adverse health effects with an adequate margin of safety	Chemical	Relevant and appropriate.
Clean Water Act	33 USC 1251-1376			
Water Quality Criteria	40 CFR Part 131	Establishes criteria for water quality based on toxicity to aquatic organisms and human health	Chemical	Relevant and appropriate. Aquifer may be a federal Class II A (discharge to surface water).
Clean Air Act of 1983	42 USC 4701			
National Primary and Secondary Ambient Air Quality Standard	40 CFR Part 50.1-6,8,9,11,12, and Appendices A,H,J,K	Establishes national primary and secondary ambient air quality standards to protect public health and welfare.	Action	Applicable.
Solid Waste Disposal Act as amended by Resource Conservation and Recovery Act of 1976	42 USC 6901			
Solid Waste Disposal Facility Criteria	40 CFR Parts 257 and 258	Sets forth revised minimum federal criteria for Municipal Solid Waste Landfills (MSWLFs) for existing and new units	Action	Relevant and appropriate for addressing landfill closure performance standards.

TABLE 2-1 (Continued)

Applicable or Relevant and Appropriate Federal Standards, Requirements, Criteria and Limitations

Standard, Requirement, Criteria or Limitation	Citations	Description	ARAR Type	
Land Disposal Restrictions	40 CFR Part 268	Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which a prohibited waste may continue to be land disposed	Action	Relevant and Appropriate. Alternatives may include the disposal of residual waste due to treatment.
Guideline for the Land Disposal of Solid Waste	40 CFR Part 241.100-213	Establishes requirements and procedures for the disposal of solid waste.	Action	Relevant and appropriate for meeting landfill closure performance guidelines.
Resource Conservation and Recovery Act of 1976				
Hazardous Waste Management System: General	40 CFR Part 260	Establishes definitions as well as procedures and criteria for modification or revocation of any provision in 40 CFR Parts 260-265	Action	Applicable for identifying hazardous waste during soil placement at OU-2.
Identification and Listing of Hazardous Waste	40 CFR Part 261	Defines those solid wastes which are subject to regulations as hazardous wastes under 40 CFR Parts 262-265	Action	Applicable for identifying hazardous waste during soil placement at OU-2.
Standards Applicable to Generators of Hazardous Wastes	40 CFR Part 262	Establishes standards for generators of hazardous waste	Action	Applicable to alternatives relating to removal or offsite transport of a hazardous material.
Standards Applicable to Transporters of Hazardous Wastes	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste withing the U.S. if the transportation requires a manifest under 40 CFR Part 262	Action	Applicable for any transport of hazardous material offsite.
Standards for Owners and Operators of Hazardous Waste TSDF's	40 CFR Part 264	Establishes standards for acceptable hazardous waste management.	Action	Relevant and Appropriate for performance guidelines for landfill closure.

TABLE 2-1 (Continued)

Applicable or Relevant and Appropriate Federal Standards, Requirements, Criteria and Limitations

Standard, Requirement, Criteria or Limitation	Citations	Description	ARAR Type	Applicability
Standards for Owners and Operators of Hazardous Waste TSDF's with Interim Status	40 CFR Part 265	Establishes standards for acceptable hazardous waste management during interim status.	Action	Relevant and Appropriate for performance guidelines for landfill closure.
Criteria and Standards for the National Pollutant Discharge Elimination System	40 CFR Part 125	Establishes criteria and standards for technology-based requirements in permits under the Clean Water Act	Chemical	Relevant and appropriate.
Toxic Substances Control Act	40 CFR Part 761.1	Substances regulated include, but are not limited to, soils and other materials contaminated as a result of spills	Action	Applicable.
Executive Order No. 11988 on Floodplains Management	42 USC 7401 40 CFR 6.302(b) & Appendix A	Requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, the adverse impacts associated with direct and indirect development of a floodplain.	Location	Applicable.
Executive Order on Protection of Wetlands	E.O. No. 11,990 40 CFR 6.302(a) & Appendix A	Requires federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists	Action/Location	Applicable.

TABLE 2-1 (Continued)

Applicable or Relevant and Appropriate State Standards, Requirements, Criteria and Limitations

Standard, Requirement, Criteria or Limitation	Citations	Description	ARAR Type	Applicability
South Dakota Waste Management Regulations	74:26:03:04	Establishes requirements for disposal of hazardous waste in sanitary landfills	Action	Relevant and appropriate.
South Dakota Waste Management Regulations	74:27:03:11	Defines requirements for closure of solid waste disposal facilities	Action	Relevant and appropriate.
South Dakota Waste Management Regulations	74:27:09:06	Defines criteria for permit applications for other solid waste TSD facilities	Action	Relevant and appropriate.
South Dakota Waste Management Regulations	74:27:15	Establishes standards for landfill closure and post-closure monitoring	Action	Relevant and appropriate.
South Dakota Waste Quality Standards	74:03:04:02,10	Defines use of Box Elder Creek and certain tributaries	Action	Relevant and appropriate.
South Dakota Ground Water Standards	74:03:15	Defines ground water classifications by beneficial use and sets chemical standards	Chemical	Relevant and appropriate.
South Dakota Surface Water Quality Standards	74:03:02	Establishes surface water quality standards.	Chemical	Relevant and appropriate.
South Dakota Remediation Criteria for Petroleum-Contaminated Soils	74:03:32,33	Establishes requirements for the remediation of soil contaminated with petroleum products.	Chemical	Relevant and appropriate.

3.0 LIST OF ACRONYMS AND ABBREVIATIONS

ACC:	Air Combat Command
AFB:	Air Force Base
ARARs:	Applicable or Relevant and Appropriate Requirements
CERCLA:	Comprehensive Environmental Response, Compensation and Liability Act
COC:	Contaminant of Concern
CRP:	Community Relations Plan
EAFB:	Ellsworth Air Force Base
EPA:	Environmental Protection Agency
FFA:	Federal Facilities Agreement
IRP:	Installation Restoration Program
JP-4:	Jet Propulsion Fuel Number Four; contains both kerosene and gasoline fractions.
µg/L:	Micrograms per liter
µg/kg:	Micrograms per kilogram
mg/kg:	Milligrams per kilogram
NCP:	National Oil and Hazardous Substances Contingency Plan
NPL:	National Priorities List
O&M:	Operation and Maintenance
OU:	Operable Unit
PAH:	Polynuclear Aromatic Hydrocarbon
PCB:	Polychlorinated Biphenyl; liquids used as a dielectrics in electrical equipment
PCE:	Perchloroethylene; liquids used in degreasing or paint removal.
RAB:	Restoration Advisory Board
RAO:	Remedial Action Objective
RI/FES:	Remedial Investigation/Feasibility Study
ROD:	Record of Decision
SARA:	Superfund Amendments and Reauthorization Act
SDDENR:	South Dakota Department of Environment and Natural Resources
SVOC:	Semivolatile Organic Compound
TCA:	1,1,1,-tetrachloroethane
TCE:	Trichloroethylene
TPH:	Total Petroleum Hydrocarbon
TSD:	Treatment, storage or disposal sites/methods
USAF:	United States Air Force
VOC:	Volatile Organic Compound

APPENDIX A

FIGURES

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APPENDIX A

Responsiveness Summary

Remedial Action at Operable Unit Five

Ellsworth Air Force Base, South Dakota

1. Overview

The United States Air Force (USAF) established a public comment period from December 28, 1995 to January 27, 1996 for interested parties to review and comment on remedial alternatives considered and described in the Proposed Plan for Operable Unit 5 (OU-5). The Proposed Plan was prepared by the USAF in cooperation with the U.S. Environmental Protection Agency (USEPA) and the South Dakota Department of Environment and Natural Resources (SDDENR).

The USAF also held a public meeting at 7:30 p.m. on January 11, 1996 in the Box Elder Middle School to outline the proposed remedy to reduce risk and control potential hazards at the Operable Unit (OU).

The Responsiveness Summary provides a summary of comments and questions received from the community at the public meeting and during the public comment period as well as the USAF's responses to public comments.

The Responsiveness Summary is organized into the following sections:

- Background on Community Involvement
- Summary of Comments and Questions Received During the Public Comment Period and USAF Responses
- Remaining Concerns

2. Background on Community Involvement

On August 30, 1990 EAFB was listed on the USEPA's National Priorities List (NPL). A Federal Facilities Agreement (FFA) was signed in January 1992 by the Air Force, EPA, and the State and went into effect on April 1, 1992. The FFA establishes a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions for EAFB.

Community relations activities that have taken place at EAFB to date include:

- FFA process. After preparation of the FFA by the USAF, EPA, and SDDENR, the document was published for comment. The FFA became effective April 1, 1992.
- Administrative Record. An Administrative Record for information was established in Building 8203 at EAFB. The Administrative Record contains information used to support USAF decision-making. All the documents in the Administrative Record are available to the public.
- Information repositories. An Administrative Record outline is located at the Rapid City Library (public repository).
- Community Relations Plan (CRP). The CRP was prepared and has been accepted by EPA and the State of South Dakota and is currently being carried out. An update to this plan will be prepared in 1996.
- Restoration Advisory Board (RAB). The RAB has been formed to facilitate public input in the cleanup and meets quarterly. In addition to USAF, EPA, and South Dakota oversight personnel, the RAB includes community leaders and local representatives from the surrounding area.
- Mailing list. A mailing list of all interested parties in the community is maintained by EAFB and updated regularly.
- Fact sheet. A fact sheet describing the status of the IRP at EAFB was distributed to the mailing list addressees in 1992.
- Open house. An informational meeting on the status of the IRP and other environmental efforts at EAFB was held on May 6, 1993. An open house was held November 16, 1995 in conjunction with the Restoration Advisory Board meeting. Information on the status of environmental efforts at

EAFB was provided.

- Newspaper articles. Articles have been written for the Base newspaper regarding IRP activity.

The Proposed Plan for this remedial action was distributed to the mailing list addresses for their comments and additional copies of the Proposed Plan were available at the January 11, 1996 public meeting. A transcript of comments, questions, and responses provided during the public meeting was prepared.

3. Summary of Comments and Questions Received During the Public Comment Period and USAF Responses

Part I - Summary and Response to Local Community Concerns

Review of the written transcript of the public meeting did not indicate community objections to the proposed remedial action. No written comments were received during the public comment period.

Part II - Comprehensive Response to Specific Technical, Legal and Miscellaneous Questions

The comments and questions below have been numbered in the order they appear in the written transcript of the January 11, 1996 public meeting.

Comment 1. Mayor Baldwin

Asked how you can justify a preferred method (Alternative 3 - installing a final cover) costing $7 to $8 million for three or four OUs that show no present or future risk, when you could spend $3 million to monitor the existing cover (Alternative 2 - institutional controls) and take care of all the problems, given the government does not have sufficient money for cleanup activities.

Response 1. The Air Force is doing all it can to address risks that may be present at OU-8. This is an area where there is something to be gained by preventing human contact with the contaminants, even though the contaminant levels are low. A good deal of the cost is in the long-term monitoring, and it is very likely that the monitoring can be cut back as time goes by. The costs you are seeing are worst case costs. The actual costs will probably be less.

The other thing to look at is, not only human risk, but to make sure the Base complies with all of the closure requirements that are in federal and state regulations, particularly for the landfills. Even though risk based analyses are conducted, there are still other requirements to meet to close a landfill so that no one comes in contact with materials that have been placed in the landfills. Whether it is a landfill on the Base or a landfill at Rapid City, South Dakota, final covers are needed to be in compliance with landfill closure regulations. At some point the Base is going to have to put final covers on the landfills. The costs involved include a 30-year long-term operation and maintenance period, which contributes to a lot of the cost. However, at the end of five years, under the CERCLA process, a review of the monitoring results will be conducted, and if the results are favorable, the monitoring can be significantly cut back. The intent of placing covers over these landfills will be to eliminate the potential for future releases of hazardous substances to humans and the environment.

Comment 2. Ms. Vivian Pappel

Asked whether state law on the closure of a landfill allows for a revisitation of the post-closure plan. Stated she didn't think that provision was in the state closure.

Response 2. State regulations call for a 30-year operation and maintenance period. The five-year review will provide information on the effectiveness of the remedial alternative. If the results are favorable it is possible to reduce the monitoring from quarterly to semi-annually, or annual monitoring, or even less. That would result in significant cost savings. It may not be possible to totally stop monitoring after five years but there is definitely potential for cost savings.